STIPP

America's Contribution to the Development of the Organ

Music

B. M.

1915

AMERICA'S CONTRIBUTION
TO THE
DEVELOPMENT OF THE ORGAN

BY

BLANCHE STIPP

THESIS

FOR THE

DEGREE OF BACHELOR OF MUSIC

SCHOOL OF MUSIC

UNIVERSITY OF ILLINOIS

1915

UNIVERSITY OF ILLINOIS

June 1, 1915.

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

BLANCHE STIPP,

ENTITLED AMERICAN'S CONTRIBUTION TO THE DEVELOPMENT OF THE ORGAN.

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF BACHELOR OF MUSIC.

G. L. Schwartz
Instructor in Charge

APPROVED: Lawrence Erb

HEAD OF DEPARTMENT OF SCHOOL OF MUSIC.

AMERICA'S CONTRIBUTION TO THE DEVELOPMENT OF THE ORGAN

I. Introduction

America's contribution to the development of the organ has been somewhat limited and of such recent years, that it is difficult to obtain information. But slight interest was taken in organ building in the United States until about the middle of the nineteenth century. Much of the improvement of the organ is due (in America) to Roosevelt, the New York builder. He spent much time on experiments in electricity and in the principle of the individual valve. Other men who have made patents are E. M. Skinner, Ira Bassett, G. S. Hutchings, J. H. Odell, C. S. Haskell and Philipp Wirsching.

The Puritans of Boston, as late as 1715, refused the gift of an organ from Thomas Brattle. The instrument went to King's Chapel and later to Newburyport and Portsmouth, N. H. It is still in existence in the latter city and capable of use. The restricted use of an instrument in the early American church was one cause for the slow development of the organ in this country. Organs were made in America as early as 1745 when Edward Bromfield, Jr., copied an English model. The first electric action organ was built in America in 1876 by Roosevelt.

Roosevelt has now (1915) been dead for several years, but his ideas have been worked upon by other builders and are being brought to perfection. Many patents have been made by Americans - perhaps the most important is that of John Turnell Austin in 1894, "the universal air-chest", by which the whole inside of the organ practically becomes a reservoir of wind. In this system which represents the

most radical change in organ building, the whole mechanism of the organ, except the key-action, is included in the wind chest.

The following explanations will be needed in this paper: The word 'stop' is used in two senses - for the handles or draw stops which are placed near the organ-player, and by which he can shut off or draw on the various registers, ~~and for the registers~~, and for the registers themselves. 'Register' refers to a set of pipes giving a certain quality of tone throughout the compass of one organ. The 'jamb' is that part of the organ on which the draw-stops are placed near the player. The 'console' consists of the manuals, draw-stops, pedals, and accessories of the organ, taken as a whole, and as distinct from the actual pipes and bellows. The 'couplers' are a mechanism by means of which when their stops are drawn one manual is combined with another, or with the pedals.

II. Draw-stop and Combination Action

A very neat and convenient draw-stop jamb was invented and patented by Ernest M. Skinner, Boston, Massachusetts, in 1898. The jambs are movable, being hinged to the ends of the console, close to the cheeks of the manual claviers. When the console is closed, the jambs are parallel to the clavier cheeks, and when the console is opened, the jambs are moved into and remain in a necessary and convenient angular position. Apart from convenience, the arrangement allows the console to be reduced in length and to be made particularly compact and portable. This form of console is commonly adopted by the Hutchings-Votey Organ Company, of Boston, for its electro-pneumatic organs. Whatever the position of the draw-stop knobs may be, they should be very carefully and distinctly grouped, so that those belonging to each

division of the organ may be readily distinguishable. In addition to a satisfactory draw-stop action every church organ of any importance should have an adjustable combination action. Hilbourne L. Roosevelt, of New York, was the first builder to demonstrate in a practical manner the great advantage of such an action. This is explained in remarks, printed in 1883, on the "Roosevelt Patent Adjustable Combination Action." By this novel contrivance the player is enabled to place any combination of stops he may require, under immediate control, altering such combination as frequently as may be desired instead of being compelled to use invariably an arbitrary and unalterable selection placed at his disposal by a builder who solely relies on the usual combination Pedals. The mechanism is controlled either by a series of pistons placed under each manual, or by ordinary Pedals; but inasmuch as the effect is not identical in each case, it will, perhaps, be advisable to describe them separately. When pistons are employed - and they are in many respects preferable, a series of them affecting the stops in each department of the instrument is placed under the corresponding manuals. Rows of small vertical levers will also be found, agreeing in number with the pistons, and displayed on the right and left of the keyboards above the draw-stops. These levers represent the registers, and are labeled accordingly, and the pressure of the lower end of any one of them will cause the stop it represents to be 'drawn on' when the piston is used which controls the row in which this lever is situated, so that any desired combination may be readily 'set' on each of these appliances.

The Pedal stops are connected with the Great Organ pistons, in addition to which, pedals are inserted whose action governs them ex-

clusively. The couplers also are controlled by this mechanism, those belonging to each manual being acted upon by its pistons. It is likewise worthy of remark that the use of this mechanism renders the partial drawing of a stop an impossibility, and as the registers are visibly operated, the tonal condition of the organ can always be ascertained by a casual glance, which is a matter of the utmost importance to an organist when dealing with an unfamiliar instrument.

III. Expressive Powers

American organ builders have displayed more intelligence than others in the matter of the expressive divisions of the organ, as in other things. The greatest builder in the United States, Roosevelt, entirely discontinued the old practice of leaving the clarinet outside a swell-box. It is a highly characteristic reed of imitative and pleasing quality, which imparts an agreeable variety to the softer combinations, and so it should have great expressive powers. This is not the case in most organs, but of forty-four schemes of organs of various sizes given by Roosevelt, there is not one in which the clarinet is left uninclosed. It was left to Roosevelt to establish a new treatment of the Great organ, that is giving it powers of expression, by means of a swell-box. Up to 1903 no steps had been taken in this direction by English, French, or German builders, and consequently America made this great contribution to the development of the organ. Roosevelt also realized the importance of inclosing the choir division in a swell-box. We put it inside the swell-box of the great organ (it should never be put in with the swell organ). This simplifies the organ, in that it requires but two expression levers. But if all conditions are favorable it is better to have a separate swell-box for

the choir and have three expression levers; but when there is a solo organ, combine the choir and great and leave the third lever for the solo division.

IV. Concert Organ

Roosevelt's organ in the Auditorium, Chicago, is not as large as others, but greatly superior tonally, and it is unquestionably the most perfect organ in all matters of flexibility, powers of expression, and mechanism, ever constructed. For this reason, the stop specifications are given. It comprises one hundred and seven speaking stops, and two mechanical bell stops, formed respectively of steel bars and bell-metal tubes. The Pedal organ contains nineteen stops all of which are unexpressive; the Great organ contains twenty stops, thirteen of which are made expressive and flexible by being inclosed in a swell-box; the Swell organ contains twenty-three stops, all of which are inclosed in a swell-box; the choir organ has sixteen speaking stops and a Carillon, of twenty-four steel bars, all inclosed in a special swell-box; the Solo organ contains fourteen speaking stops and chimes, of twenty-five tubular bells, all inclosed in a separate swell-box; the Echo organ contains eleven stops, inclosed in a special swell-box; and the Stage organ consists of four uninclosed stops. Of the one hundred and seven speaking stops seventy-seven are rendered flexible and expressive by being inclosed in five independent swell-boxes, controlled by three balanced levers. Roosevelt also fitted his concert organs with "automatic adjustable combination action". The leading European builders have given this little attention, and its introduction and practical application appear to be due to the ingenuity and skill of Canadian and American builders. They were used

in America as early as 1883 when not an attempt had been made toward a similar action in Europe. The speaking stops of the concert organ are quite important, and of those of orchestral tone should be as highly imitative as possible. A closer imitation of the horn, euphonium and saxophone is yet to be obtained. The best imitation of the saxophone is that produced by a labial stop invented by Mr. W. E. Haskell of Philadelphia, Pennsylvania. The metal, labial pipes most successfully imitate the orchestral instruments.

V. Chamber Organ

As to the Chamber organ little has been done in any country. But in the last ten years there has been an awakening interest along this line, notably in America. The most progressive builders are attempting to work out a good Chamber organ and not allow a 'boxed-up' small church organ to serve the purpose any longer. This organ should have imitative voices in a refined character and should be developed along the lines of the concert organ, in the proper proportions. The Aeolian Company has done wonders in this particular, but their organs are so expensive that few can have them.

VI. Tonal Appointment of the Organ

The pipes of the organ may be divided into the following groups:

First Group	Second Group
Organ Tone	Orchestral Tone
Unimitative Quality	Imitative Quality
1. Pure Organ-Tone	1. Orchestral Flute-Tone
2. Free Organ-Tone	2. Orchestral String-Tone
3. Flute Organ-Tone	3. Orchestral Reed-Tone
4. Viol Organ-Tone	4. Orchestral Brass-Tone

The first group includes the pipes which really make up the organ pipes, but are the easiest obtained; the second group gives the orchestral coloring and require a great deal of care and experiment. The solo stops of the American organ are beautifully voiced, especially the soft ones. In this respect America is far in the lead of the world. German and American builders have paid more attention to the tonal appointment of their organs than any others. The Americans have given especial heed to the claims of wood stops and the tonal characters of their organs have gained accordingly, for in the wood stops, which yield the flute organ-tone we have a most valuable series of voices. In the greatest concert organ in America (1903) Auditorium, Chicago, as to tonal appointment the imitative string-toned stops were very unsatisfactory. Up to about that time the orchestral oboe had invariably been a small-scaled metal reed stop, but about 1903 an open wood labial stop was invented by Mr. Haskell, of Philadelphia,-the tone of which is a splendid imitation of that of the orchestral instrument when properly played. As before mentioned, Mr. Haskell also invented the best and only satisfactory organ stop yet made, that yields tones strictly imitative of saxophones. This pipe is not a reed--but a small-scaled open wood stop, furnished with cylindrical harmonic bridges. This stop opens up possibilities in tone production that point to further advances in the organ as a musical instrument.

Another important factor in the tonal appointment of the organ is its expressive powers. Hilbourne and Frank Roosevelt realized the great advantage of having a part of the speaking stops of the Great organ in a swell-box. In the organ building world no builders have

realized the artistic necessity of imparting expressive powers to the Choir organ as the Roosevelts of New York and their practical advocacy forms a valuable page in organ history. Perhaps the most noteworthy Echo organ, in a modern instrument, is that of the large organ in the Auditorium at Chicago. It is in an elevated locality, above the hall, more than a hundred feet from the console, is inclosed in a swell-box, and is played from the fourth or Solo organ clavier.

VII. Compass

The compass of the organ varies greatly, not only in different countries but with the various builders of every country. The downward range is more firmly fixed than the upward. In the United States the CC (two octaves below middle C) downward limit has always been in favor, as both English and German influences lead to this desirable end. To-day this downward limit is invariably adopted for the manual claviers of organs of proper construction. In America the top range is g, a, (two octaves and a half above middle C) or c (three octaves above middle C). The Roosevelt organs in the Cathedral of Incarnation, Garden City, Long Island, and Grace Church, New York, have all their manual claviers carried up to c, as have all American organs of recent years. But there are many examples of the g and a limits in American organs. The highest limit in pedals is G (32 notes from low C) -- one at Convention Hall, Kansas City, Missouri.

VIII. The Swell

The swell in the organ was invented by Englishmen first, in London in 1712. In America the work of the Messrs. Roosevelt, New York, has done much toward the development and improvement of this phase of the instrument. Their organ at the First Congregational

Church, Great Barrington, Massachusetts, has three manual divisions (exclusive of the Echo of five stops), forty-eight speaking stops, of which thirty-eight are expressive and under perfect control as regards strength of tone. Disposition of the stops: Great--seventeen stops, seven inclosed and accordingly partly expressive; Swell--eighteen stops--is enclosed and entirely expressive; and Choir--thirteen stops --in a separate swell-box and entirely expressive. We find the greatest development achieved by Roosevelt in his organ at the Auditorium, Chicago, in the direction of flexibility and expression. Of the eighty-six sounding stops, seventy-nine are enclosed in five separate swell-boxes and these are controlled by three balanced expression levers. No organ scheme devised in any country previous to 1908 can in the least be compared with the plan made, but not used, for the organ in Sydney, N. S. W. in matters of flexibility, expression, easy control, and mechanical accessories. The largest and most remarkable organ in existence in 1908 was that built by the American Art Organ Company, Los Angeles, California, at Convention Hall, Kansas City, Missouri. It presents what may be safely considered to be the highest practical development in the direction of flexibility and powers of compound expression.

IX. The Manual Clavier

A single manual clavier, in a finished instrument has two principal divisions; namely, the key-frame or the framework which supports the keys, and the keys, which are movable. The cheeks of the key-frame are the two thick rails, set on edge, which form its sides. The long quadrangular rod which forms the lever or main portion of a key is termed the body or stock; the combs are the raised pieces of ebony

attached to the playing portions of the shorter key bodies which form the sharp keys, and the platings are the thin plates of ivory attached to the playing portions of the longer key bodies which form the natural keys. When there are two, three, four or five claviers they must be placed close enough together that the performer can perform on two consecutive claviers with the thumb and fingers of one hand. This is attained in one of two ways: by bringing the playing portion of one nearer to the level of the other than would otherwise be practicable, or by advancing the upper so as to overhang the lower one without making it inconvenient to manipulate the latter. The projecting keyboards are used almost universally by American builders and they have shown that they should be invariably used in case of three, four or five claviers. The Roosevelt organs have made a good step in this direction by giving the same amount of projection to each row, which is to be commended on account of appearance and utility.

X. The Manual Couplers

The sticker coupler was introduced by English and American organists, but to find the unison sticker coupler in its highest development one must look to the works of certain American organ builders, in which one finds that careful attention to minute detail which is rarely met with in the works of European builders. American builders of first rank exercise great ingenuity, skill, and care in all such mechanical details; and in this direction surpass the builders of all other countries. The following description is of the manual claviers and unison couplers as adopted by the late Roosevelt Company. This coupler has a flat sticker which passes first through the sliding register, and thence through slots cut in Swell keys, above which

they are hinged to the rocking adjustable bars. The rocking bars are secured to the upper surface of the Swell keys by two screws each; and these screws, operating against each other provide an easy and perfect adjustment of the coupler without requiring the removal of any keys.

XI. The Relief Pallet

The wind-chest is that portion of the organ on which pipes are planted, and by means of which the compressed air from the bellows is supplied to the pipe-work through the agency of the mechanical parts of its construction which are commanded by the key and draw-stop action of the instrument. The pallet and slider wind-chest (in common use to-day) comprises two important divisions; the larger designated as the wind-chest proper, and the smaller division the pallet-box. The wind-chest proper consists of the frame, the table on which it is built, the sliders and bearers, the upper-boards, and the rack-boards, which are merely supports for the feet of the pipes. The pallet-box, in its usual and simplest form, is an air-tight box which is attached to the under face of the wind-chest frame, extending its entire length. The resistance and strain caused by the pressure of the condensed air upon the closed pallets of the wind chest is its most objectionable element. In 1894 Messrs. William and Edward King patented a simple lever action for relieving the touch in connection with the ordinary slider and pallet wind-chest. The main feature of the invention is the combination with a pallet of several pull-down wires connected therewith at different distances from the movable end of the pallet, and means for moving the pull-down wires successively.

XII. The Pneumatic Lever

The pneumatic lever is an air appliance for relieving the weight of the touch of large instruments. It was first invented in England, but American builders have done the most toward bringing it nearer perfection. There is a chamber charged with compressed air from the organ bellows; then a wire, connected with the manual key, draws down a pallet which admits this compressed air into a smaller chamber. The chamber has three openings: one over the pallet; one to the external air; and one for the reception of the conveyance pipe. Above the opening to the external air is a disc-valve, connected by a wire with the pallet. Then a small bellows is connected with the chamber by the conveyance pipe. Above this apparatus is a small wind-chest. Its lower chamber is the pallet-box charged with compressed air from the bellows, while above is one of the grooves of the chest on which the pipes are planted. This mechanism greatly relieves the touch of the manual keys. In 1888, Mr. Ira Bassett, of Chicago, Illinois, patented an improved exhaust pneumatic lever action, which is in several respects the most satisfactory, as it certainly is the most compact ever invented. The Roosevelt and Bassett appliances, constructed similarly to the one described above have aided greatly in the development of the organ. The Bassett lever has been highly recommended by W. F. Crosby, General Manager of the Roosevelt Organ Factory, and A. B. Felgemaker, organ builder of Erie, Pennsylvania. Tubular pneumatic action although an English invention has been so greatly improved by Americans that its present successful appliance is due to them.

XIII. Tubular Pneumatic Action

The object of the tubular-pneumatic action is to do away with the complicated mechanism for connecting the keys with the pallets of the sound-boards. The pneumatic apparatus at or near the keys is connected with that of the instrument, and in connection with the pallets by means of a tube or tubes. There are many forms, each slightly different from the other, but that which constitutes the tubular-pneumatic action is alike in all: namely, the pneumatic tube, connecting the mechanical part directly and immediately controlled by the keys with the distant appliance (through any intermediate appliances) which directly commands the movements of the wind-chest pallets or valves. There are five strikingly different systems. The fifth and the best of all is that in which natural exhaust is alone used to control the pallets of the wind-chest, and in which the key valve-box is a very simple appliance: its valves, which are directly connected with the keys, have merely to open and close the near ends of the pneumatic tubes in the free air. The compressed air, which is allowed to escape or exhaust itself into the surrounding air on the opening of a key-valve, is furnished by the organ-wind in the pallet-box of the distant wind-chest, in which are placed the pneumatic levers or motors for actuating the pallets which supply the pipe-work. The most satisfactory action on this excellent system is that invented and patented by Mr. John W. Odell, of New York. Other American patents constructed on the same general principle are a valve-box patented by Mr. W. E. Haskell of Brattleboro, Vermont, and a "new and improved tubular-key and pneumatic-valve action" by Mr. Peter Baggstrom of Brooklyn, New York.

XIV. The Combination Action

The combination action of the organ is that portion of its mechanism by means of which certain fixed or adjustable combinations of speaking stops and couplers are brought into use by single operations of the performer's hands or feet. The early combination actions were not adjustable, that is, the combinations were permanently set on the several pistons. It is only in the last fifteen years that English organ-builders have realized the importance of an adjustable combination action. It was some years after Mr. Hilbourne L. Roosevelt applied his "Patent Adjustable Combination Action" to his fine organs that any such attempt was made in Europe. To Americans belongs the credit of having invented and successfully applied this action to the organ. This is essentially important, since, no matter how complete the action or mechanism, it is very imperfect unless it is immediately adjustable by the hands of the performer. The earliest attempt toward this action was made in America by H. L. Roosevelt in 1882, and most of the work along this line was done by Americans. Others who aided are Frank Roosevelt, George A. Hutchings, of Cambridge, Mass., Jesse Woodberry, Boston, and Philipp Wirsching, of Salem, Ohio.

XV. Electricity

Electricity has come to take an important part in the organ-building world of the last twenty years. The electric-pneumatic action is used to some extent now, although when first introduced it was thought to be very unreliable. The Roosevelt Company has spent much time, energy and money on the development of this particular phase of the organ. Others who have made important inventions are W. B. Fleming, Edwin S. Votey, and Ernest M. Skinner. The Americans

seem to be the most ingenious and are unexcelled in these later contrivances which are gradually perfecting the "King of Instruments". The first electric action organ was set up in America at the Centennial Exposition, 1876. The electric action makes the communication between the key and pipe by means of electricity. It is admirable when the pipes are a long distance from the keys, but is quite liable to get out of order. The Roosevelt invention of electric action gave rise to placing a part of the pipes a long distance away from the keyboard, and so echo effects were possible which would have been entirely impracticable under the old regime. The perfection of the electric organ, built in 1876 was the most successful of its kind then. In 1895 Edwin S. Votey took out three electro-pneumatic patents, all connected with the wind-chest. In 1898 Mr. E. M. Skinner took out a patent for several important inventions. He greatly improved the electrical coupler and the electro-magnet. In 1900 Mr. W. B. Fleming patented a good key contact. In this device a metal plate is screwed on the upper surface of the key tail, carrying at its free end a small transverse piece, preferably of silver wire. The contact is a spring plate, on the under side of the free end of which a corresponding piece of silver wire is attached diagonally. When the key is depressed, the pieces of silver wire come together with a sliding motion, preventing the liability to undue wear or burning out at any point. This is the most successful of the various forms thus far invented.

It is shown by the foregoing that America has been the prime factor in the development of many parts of the organ and is rapidly coming to the front in the organ building world.

Bibliography

1. Encyclopedia Americana .....Vol. XI

2. Encyclopedia Brittannica.....Vol. XX

3. The Organ and Its Masters.....Lahee

4. The Art of Organ Building.....Audsley

5. Universal Musical Encyclopedia.....Vol. I

6. Dictionaries.....(Grove, (Stokes

7. Practical Treatise on Organ Building.....Robertson

8. Magazines.....(Popular Science Monthly..Vol. LVII, (Harper's Weekly.....Vol. XL, (Music.....Vol. XV